

which was represented only by two species at the mouth of the Taimyr and none at Cape Chelyuskin. So also with the Cyperaceæ and Ranunculaceæ. *Saxifraga oppositifolia* is not the most widely-spread species on the Siberian northern coast, as is the case for other parts of the Arctic region, other species of Saxifraga being as much or more extensively spread than it. The most usual phanerogamous plants on the coast seem to be the *Luzula arcuata*, var. *hyperborea*, and *Stellaria longipes*.

We shall not analyse the valuable paper by M. Kjellman on the flora of Novaya Zemlya, which is a summary of all that is known on this subject, and we shall notice but a few facts concerning the vegetation of the Siberian coast of Bering Strait. It is represented on M. Kjellman's lists by 221 species belonging to 41 families and 109 genera. The Compositæ, Cyperaceæ, Saxifragaceæ, Caryophyllaceæ, and Gramineæ, numbering from 20 to 15 species each, are here also the richest as to the number of species. But we find on the Asiatic coast of the Bering Strait a good many plants belonging to the American flora, as also to the flora of the Altai and Baikal regions, which are not met with elsewhere on the northern coast. No less than 53 species out of 221 appear only to the east of the Kolyma, which appears thus to be, for the coast-region, a more important boundary line than the Obi. This notable increase cannot be accounted for only by the milder character of this region, but it could be explained, in our opinion, if we took notice of the orography of Eastern Siberia, which favours, by the extension of its chains of mountains from south-west to north-east, the spread of both animals and plants in the same direction.

Dredging was very diligently carried on during the whole of the cruise of the *Vega* in the Arctic Ocean; and Mr. Stuxberg's map of dredgings made during the Swedish expeditions of 1875, 1876, and 1878 to 1879, is dotted with 33 spots in the Kara Sea, and with 90 spots along the Siberian coast to Bering Strait. The temperature of water obviously was found to be very low; even at a few fathoms below the surface it was from -0.9° to -2.3° at a depth of 50 metres, and it had a normal specific gravity of 1.027. The most uniformly spread animals in the Siberian coast-region of the Arctic Ocean, and in the Kara Sea, are undoubtedly the Crustaceans; the Echinoderms are comparatively few, as also are the Mollusca, Bryozoa, and Hydroids. The Crustaceans *Idothea Sabinei*, *Idothea entomon*, *Diastylis Rathkei*, *Atylus carinatus*, and *Acanthostephia Malmgreni*, are the most usual. The first, as known, has been found nearly everywhere in the Arctic Ocean; whilst the second proved to be specific for the whole of the Arctic coast of the old continent, for a stretch of nearly 160 degrees of longitude; it has been found also in the lakes of Sweden and Northern Russia, even in the Caspian and Lake Aral—Lake Baikal being till now the sole explored great lake of this part of the old continent where it has not yet been found. As to the vertical distribution of the animal forms, no distinct regions can be established. It must be observed, however, that the littoral region—about 30 fathoms deep—on account of its ice and sweet water brought by rivers, is nearly quite devoid of animals; even the littoral forms go to take refuge in the sublittoral region. Not only is the Siberian Sea very rich in forms of animals (the number of described Amphipods being as much as 59 out of 114 Amphipods known in all Arctic seas together); it contains also such a number of individuals of certain species, that Mr. Stuxberg describes about 20 real "formations" (*djurformationen*), each consisting of very large quantities of individuals of one given species, with a comparatively small mixture of other species. Such are the *Diastylis Rathkei*, *Reticulipora intricaria*, *Alcyonidium mammillatum*, *Chiridotia laevis*, *Echinus dröbachiensis*, *Asterias Lincki*, *Archaster tenuispinus*, *Ctenodiscus crispatus*,

Ophiacantha bidentata, *Ophiocten sericeum*, *Ophioglyphia nodosa*, *Astrophyton eucnemis*, *Antedon Eschrichti*, *Yoldia arctica*, and *Idothea entomon*, as also Ascidiae, Actiniae, and Hydroids. As a whole, the Siberian basin differs very much in its fauna from the other parts of the Arctic basin, and it has no less than 16 species that are characteristic of it. Novaya Zemlya is the limit of the fauna of the Siberian Sea, being a separation-line for many species.

The foregoing notice will give a general idea of the valuable material contained in the first volume of the "*Vega's* Scientific Work," and the manner it is treated. We have but to express the wish to see, as soon as possible, the appearance of the following volumes of this series. They will surely give a new and powerful impulse to the study of Northern Siberia. P. K.

NOTES

WE are glad to learn that Mr. Spottiswoode continues to go on favourably.

STILL another well-deserved honour for Sir Joseph Hooker. The Society of Arts' Albert Medal for "distinguished merit for promoting arts, manufactures, or commerce," has been awarded to him for the present year, for the eminent services which, as a botanist and scientific traveller, and as Director of the National Botanic Department, he has rendered to the arts, manufactures, and commerce by promoting an accurate knowledge of the flora and economic vegetable products of the several colonies and dependencies of the Empire.

AMONG those to whom the Council of the Society of Arts have awarded their silver medals are Mr. Alex. Siemens and Dr. Hopkinson, for their papers on "The Transmission of Power by Electricity," and "The Portrush Railway," and to Capt. Douglas Galton for his paper on "The Economy of Sanitation." Thanks were voted to Mr. W. H. Preece, F.R.S., for his paper on Electrical Exhibitions.

A SPECIAL extra meeting of the Anthropological Institute was held at the Piccadilly Hall on Tuesday, when the Botocudo Indians and a large ethnological collection from Brazil were exhibited by the kindness of Mr. C. Ribeiro, and Prof. A. H. Keane read a paper descriptive of the Botocudos.

MR. MARK H. JUDGE has resigned his position as Secretary and Curator of the Parkes Museum.

M. DE LESSEPS has declared officially at the Academy of Sciences the intention of the Suez Company to open a new canal. During the works the maritime way will be lighted by electricity, and an appeal has been addressed to physicists to present their several systems. The work will begin as soon as possible.

WE have received a favourable report of the National Museum, Bloemfontein, Orange Free State. Considerable collections are being brought together, but the committee should not forget that the chief object of such a museum ought to be to make its collections mainly representative of the interesting country in which it is placed.

DR. KERR of Canton is publishing in Chinese a complete work on the theory and practice of medicine, compiled from European standard works upon that subject. The sections on fevers, and diseases of the stomach, have already been published, while those on affections of the heart and lungs have just been issued. Volumes on the kidneys and nervous system are in the press. The translator has omitted the discussion of all unsettled theories and disputed points. The volumes are printed from wooden blocks, clearly and evenly cut, and are sold at a price which brings them within the reach of all.

MR. J. W. TAYLOR of Leeds, who is the editor of the *Journal of Conchology*, has issued a prospectus for a "Monograph of the Land and Freshwater Mollusca of the British Fauna," and he invites the assistance of conchologists towards his proposed undertaking. According to the prospectus the work will be very comprehensive, and will include the subjects of variation, geographical and local distribution, synonymy and bibliography, "biological aspect and relation to environment." It would be desirable to add distribution in point of time or the paleontological aspect. Mr. Taylor has given specimens of the work in some of the lately published numbers of his *Journal of Conchology*, and they seem to be carefully and almost exhaustively done. We hope the cost of this work will place it within the means of the numerous and comparatively poor conchologists in the north of England, as so many manuals on the subject have already been published at very moderate prices. Great service would likewise be done to natural history by reducing the excessive number of so-called species fabricated during the last twenty years by some Continental conchologists. The judicious remark made by Hooker and Thomson in the introduction to their "Flora Indica" ought always to be borne in mind, viz. that "the discovery of a form uniting two others previously thought distinct, is much more important than that of a totally new species, inasmuch as the correction of an error is a greater boon to science than a step in advance."

THE *Union Médicale* of June 2 announces a discovery of the highest scientific interest, and which, if it turns out to be real, will show that prehistoric man is no longer a myth. On piercing a new gallery in a coal-mine at Bully-Grenay (Pas-de-Calais), a cavern was broken into containing six fossil human bodies intact—a man, two women, and three children—as well as the remains of arms and utensils in petrified wood and stone, and numerous fragments of mammals and fish. A second subterranean cave contained eleven bodies of large dimensions, several animals, and a great number of various objects, together with precious stones. The walls were decorated with designs of combats between men and animals of gigantic size. A third and still larger chamber appeared to be empty, but could not be entered in consequence of the carbonic acid it contained, which is being removed by ventilators. The fossil bodies have been brought up to the surface, and five of them will be exhibited at the *mairie* of Lens; the others are to be sent to Lille in order to undergo examination by the *Faculté des Sciences*. Representatives of the *Académie des Sciences* of Paris and of the British Museum having been telegraphed for, are expected to be present.

THE Lords of the Committee of Council on Education have sanctioned the addition of hygiene to the list of sciences in which grants are made by the Department. A syllabus has been prepared, and will shortly be issued to science schools and classes.

FROM the third Annual Report of the Hampstead Naturalists' Club we are glad to see that the society is in a prosperous condition, and is gradually getting together a useful museum.

G. P. PUTNAM'S SONS of New York have published a nicely got up and profusely illustrated Guide to the Yellowstone National Park, by Mr. H. J. Winsor, which those proceeding to the States for their holiday would do well to get.

NEXT month Messrs. Williams and Norgate will publish a new work, entitled "The Natural Genesis," in two volumes, by Mr. Gerald Massey, containing the Natural Genesis and Typology of Primitive Customs; Gesture-signs, Ideographs, and Primordial Onomatopœia; Time and Numbers; the Serpent, Dragon, and other Elementaries; the Tree, Cross, and Four Corners; the Great Mother, Twins, Triads, and Trinity; the Mythical Creations; the Fall in Heaven and on Earth; the Deluges and Ark; and Equinoctial Christology.

A WRITER in a recent number of the *North China Herald*, referring to fossils in China, remarks that the Chinese have never advanced a theory to explain their existence. In their books references are made to fossil shells, crabs, fish, trees, &c., but no attempt is made to account for their occurrence in solid rock. The little that is said is mostly of the marvellous sort. Ammonites are petrified snakes; fossil brachiopods (lampshells) are called "stone swallows," and are said to come to life and fly from their hiding places at the approach of wind and rain, changing again to stones on the return of fair weather. Fossil fish appear and disappear at pleasure, and their appearance prognosticates a plentiful harvest and prosperous times. One author supposes that the figures of birds, beasts, and plants, which he had seen on certain slabs, must be the work of gods or devils, for no human hand could chisel anything so minute and delicate.

CRACKERS play a large part in the superstitious observances of the ordinary Chinese. It is a popular belief that the evil spirits everywhere inhabiting the air are dispersed by crackling noises, attended by fire and smoke. Accordingly crackers are used on all special occasions to frighten away the demons who are tormenting a sick person, or who crowd around the people at the beginning of the New Year. Bamboo, which when burning emits a crackling sound, is also used for the same purpose.

WE have received the Report of the West Kent Natural History, Microscopical, and Photographic Society for 1882-83. It appears to be more bulky than its predecessors, extending to 68 pp. 8vo. The President (Dr. F. T. Taylor) discourses on Bacteria and Vivisection; Mr. J. Glaisher, F.R.S., gives a very instructive paper on the extraordinary meteorological conditions between October 1881 and May 1882, illustrated by two diagrams indicating the mean daily barometric and thermometric readings, and their departure from the mean, as observed at Blackheath; Mr. J. Jenner Weir, F.L.S., discusses on the types of variation in Lepidoptera, in which is embodied much useful information; Mr. Stone alludes to certain points in the economy of wasps; Mr. Heisch's notes on "Adulteration" are of practical interest. In their next Report this old-established Society may perhaps think it advisable to give a tabular indication of the "contents"; the same remark would apply equally to the publications of other local societies.

UNDER the title of "Lantern Readings" Mr. Lant Carpenter has issued a pamphlet to be used (when necessary) with the first series of the biological lantern slides which we referred to in a recent number. These slides are now ready, and may be obtained from York and Son. The pamphlet and slides are intended to illustrate the results of the voyage of the *Challenger*. There are descriptions of forty-two slides in all, and "preliminary hints" show how the pamphlet is to be used.

THE additions to the Zoological Society's Gardens during the past week include two Malbrouck Monkeys (*Cercopithecus cynosurus* ♂ ♀) from West Africa, presented respectively by Mr. L. Morris and Mr. A. M. Moore; a Macaque Monkey (*Macacus cynomolgus* ♀) from India, presented by Mr. E. J. H. Sprague; a Rhesus Monkey (*Macacus erythraeus* ♂) from India, presented by Mr. C. T. Pollock; a Bonnet Monkey (*Macacus radiatus* ♀) from India, presented by Mr. F. Nelson; two Mauge's Dasyures (*Dasyurus maugeti*) from Australia, presented by Sir Louis S. Jackson, F.Z.S.; two Earl's Weka Rails (*Ocydromus earlii*) from North Island, New Zealand, a Black-backed Porphyrio (*Porphyrio melanotis*) from Australia, presented by Capt. R. Todd; three Common Kingfishers (*Alcedo ispida*), British, presented by the Hon. and Rev. F. G. Dutton; a Common Night Heron (*Nycticorax griseus*), European, presented by Mr. H. H. Blacklock; a King Penguin (*Aptenodytes pennanti*), two Upland

Geese (*Bernicia magellanica* ♂ ♀), two Ruddy-headed Geese (*Bernicia rubriceps*) from the Falkland Islands, presented by Mr. R. C. Packe; three Common Pheasants (*Phasianus colchicus* ♂ ♀ ♀), British, presented by Mr. H. T. Bowes; an Indian Python (*Python molurus*) from India, presented by Mr. G. E. Shute; a Sykes's Monkey (*Cercopithecus albigularis*), a Philantomba Antelope (*Cephalophus maxwelli* ♀), an Elate Hornbill (*Buceros elatus*), a Jardine's Parrot (*Papeocephalus gularis*) from West Africa, an Indian Civet (*Viverricula indica*), two Wandering Tree Pies (*Dendrocitta vagabunda*), from India, a Red-sided Eclectus (*Eclectus polychlorus*) from New Guinea, five Red-bellied Conures (*Conurus vittatus*), a Giant Toad (*Bufo aqua*) from Brazil, a Horned Lizard (*Phrynosoma cornutum*) from Texas, four Cornish Choughs (*Fregilus graculus*), British, purchased; a Common Rhea (*Rhea americana*) from South America, received in exchange; two Indian Pythons (*Python molurus*) from India, received on approval; a Japanese Deer (*Cervus sika* ♂), born in the Gardens.

OUR ASTRONOMICAL COLUMN

THE PARIS GENERAL CATALOGUE OF STARS.—In the last Annual Report issued by Admiral Mouchez we find particulars of the progress of formation of this extensive and important catalogue. It is intended to contain all the stars observed at Paris during the forty-five years 1837 to 1881 inclusive, about 40,000, but it is mainly the result of the revision of Lalande's stars in the *Histoire Céleste*; indeed, for several years past, the meridian instruments have been almost wholly occupied upon this work, and upwards of 27,000 observations were made during 1882, the year to which the Report refers. The entire number of observations upon which the Paris General Catalogue will be founded is about 350,000. The positions are referred to three principal epochs; 1845.0 for the years 1837-53, 1860.0 for the years 1854-67, and 1875.0 for the years 1868-82. A specimen of the form in which it is intended to print the catalogue is appended to the Report. The right ascensions and declinations are given for each principal epoch, with the number and mean year of the observations. The precessions are reckoned from the year 1875, with the term depending upon the square of the time. The magnitudes and the differences from the positions of the *Histoire Céleste* are annexed, and where a star has not been observed by Lalande a synonym in some other catalogue is given. In the first column we have the ordinal number, and in the second the star's number in the reduced catalogue of the *Histoire Céleste*. It is mentioned in the Report that M. Bossert had undertaken a new determination of the places of the stars in that work, making use of the reduction-tables of the late Doctor von Asten, which are more exact than the tables of Hansen and Nissen, employed for the catalogue published in 1847. M. Bossert has already effected the reduction of 2,300 stars, a voluntary labour which has occupied his leisure hours. It would add to the value of the columns showing the differences between the new Paris positions and those of Lalande, if the comparisons could be made with places resulting from the application of von Asten's tables, though it might be necessary to supplement M. Bossert's laudable efforts. In the last Greenwich Catalogue (1872) the precessions are given to four places of decimals in right ascension (time), and to three places in north polar distance; the Paris Catalogue gives these quantities with a figure less, which we are inclined to regard as a retrograde step.

This General Catalogue of the Observatory of Paris is to comprise two parts, which will be published simultaneously; the first part forming the catalogue proper, and the second containing details of the observations upon which the mean positions are founded. Each part will be composed of four volumes; the first volume of each is intended to appear during the year 1884.

ENCKE'S COMET IN THE YEARS 1871-1881.—At the sitting of the Paris Academy of Sciences on June 11, M. Tisserand communicated a note by Dr. Backlund, of the Observatory of Pulkowa, relative to the motion of Encke's Comet in the interval 1871-1881. To complete the theory of this comet, it has been necessary to introduce an empirical to the mean motion of the form $\mu' \left(\frac{t}{1200} \right)$. The quantity μ' , which was found to be nearly constant during the period 1819-1868, appears to have under-

gone a considerable variation about the latter epoch. Dr. Backlund bases his calculations upon osculating elements for October 27, 1874, which he considered exact enough for his purpose: they give—

$$\mu = 1079''33355 + \mu' \tau \quad \left(\text{where } \tau = \frac{t}{1200} \right)$$

$$\mu' = + 0.051731$$

After having carefully reviewed the computation of perturbations by Asten, and calculated by two different methods the perturbations during the revolution 1878-1881, Dr. Backlund compared the elements with the observations made in the years 1871, 1875, 1878, and 1881. By means of this comparison, he obtains corrections to the elements, and, observing that if there exists a tangential force, which varies the dimensions of the comet's orbit, its effect is not only secular, but also periodic, the periodic terms being always very small, except in the expression for the mean anomaly. This he takes into account, and finally deduces for the corrections of the two quantities above—

$$\Delta\mu = + 0''.004745$$

$$\Delta\mu' = - 0.0059867$$

Hence, he says, his investigation proves that the acceleration of the mean motion in the period 1871-1881 was less than half the value found by Encke and Asten for the period 1819-1865. Asten's value is $+ 0.104418$.

CHEMICAL NOTES

INTERESTING experiments on the luminosity of gases are described by W. Siemens in *Ann. Phys. Chim.* [(ii.) 18, 311], and by E. Wiedemann [*ib.* 509]. Gases free from solid particles do not become luminous at high temperatures, nor is the luminosity of a flame due to incandescence of the products of combustion; if the gases are strongly heated before being burnt, the flame becomes hotter and shorter than it is when the preliminary heating is omitted, and the luminous flame is seen to be distinctly separated from the non-luminous products of combustion. Siemens seems inclined to regard the chemical action which proceeds as the cause of luminosity; if the existence of an envelope of ether around the molecules is assumed, then the reaction of one molecule on another may be regarded as starting vibrations in this envelope, which vibrations give rise to heat and light rays. Wiedemann especially considers the luminosity of gases under the influence of electric discharges: he thinks that in the process of charging the electrodes the ethereal envelopes of some of the gas molecules are distorted; when discharge occurs these envelopes are set into motion, and hence the luminous effects.

SOME time ago Ostwald deduced the relative affinities of various acids in terms of nitric acid taken as 100; by relative affinity is meant the proportion in which two acids divide themselves between one base, all the reacting substances being in solution. Ostwald has recently investigated this subject by a method different from that formerly employed; he has studied the rates of action of various acids on acetamide, and from the results he has deduced the relative velocities of action, and hence the relative affinities. The following table contains the results. In column II. are placed figures representing the results of his former experiments—

	I.	II.
Hydrochloric acid	100	98.0
Nitric	98	100
Hydrobromic	98	95
Trichloroacetic	80	80
Dichloroacetic	40.8	33
Monochloroacetic	13.0	7
Formic	5.2	3.9
Lactic	5.2	3.3
Acetic	2.3	1.2
Sulphuric	65.4	66.7
Oxalic	22.6	—
Tartaric	7.5	5.2
Malic	4.7	2.9
Succinic	2.5	1.5
Citric	4.0	—
Phosphoric	3.6	—
Arsenic	3.5	—

M. SPRING continues his researches into the influence of great pressure upon chemical reactions: at a pressure of about